

Case report

Implantation of migrated biliary stents in the digestive tract

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Background

Biliary stents constitute an alternative for the palliative treatment of benign or malignant biliary obstruction, biliary strictures, choledocholithiasis, biliary fistulas from lateral lesions of the biliary duct or cystic duct leaks due to slippage of clip closure. Obstruction resulting in cholangitis is common. Proximal migration to the biliary duct or distal migration to the duodenum with subsequent passage per rectum are relatively frequent, but impaction and perforation of the bowel are rare.

Case outlines

Two cases are reported. In one patient a migrated stent impacted in the caecal wall, and in the other the impaction produced a perforation of an adherent small bowel loop. Both

patients were treated surgically and made an uneventful recovery.

Discussion

Biliary stents migrate in 8–10% of patients and are generally eliminated by natural means. Occasionally they impact and perforate the digestive tract, usually in the duodenum or other fixed areas or in bowel affected by adhesions due to a previous operation. Although endoscopy is the treatment of choice to retrieve them, operation should be performed whenever there is suspicion of perforation of the intestinal wall.

Keywords

biliary stents, migration

Introduction

Migration of biliary stents occurs in up to 10% of patients, but perforation of the intestine is rare. We present two patients with impaction and perforation of the bowel by a migrating biliary stent.

Case reports

Case no. 1

A 62-year-old woman was discharged 24 hours after laparoscopic cholecystectomy. On day 6 she developed intense pain of rapid onset in the right upper quadrant with fever and leucocytosis, and she was re-admitted to hospital. Echography showed a thin bile duct and fluid in the abdominal cavity. Percutaneous drainage extracted 1200 ml bile from the right hypochondrium and the pouch of Douglas. Because of persistent drainage

(600 ml) an ERCP was performed on the following day and revealed a biliary leak through the cystic duct. Sphincterotomy was performed and an 8 Fr plastic stent (Tannenbaum type, Wilson Cook) was placed. The clinical picture improved, and the patient was discharged from hospital. One month later she reported pain in the right iliac fossa. Abdominal computed tomography revealed that the stent was implanted in the caecal wall, and laparotomy confirmed this diagnosis. The caecum was opened and the stent was observed to be impacting and perforating the mucosa and muscularis but not the serosa. The stent was removed and the caecotomy was closed. The patient made an uneventful recovery.

Case no. 2

A 62-year-old woman with a history of a caesarean section 30 years previously was admitted to hospital with

jaundice, epigastric pain and fever. Laboratory tests were abnormal for total bilirubin (188.1 $\mu\text{mol/L}$; 11 mg/dl), direct bilirubin (153.9 $\mu\text{mol/L}$; 9 mg/dl), white blood count $20 \times 10^9/\text{L}$ and amylase (900 IU: normal <120 IU).

Echography showed gallbladder stones and a dilated bile duct containing a stone. ERCP revealed abscess formation at the papilla with an impacted stone that impeded cannulation. Open cholecystectomy and choledochotomy were carried out and showed an embedded stone that could not be removed and abundant pus in the biliary duct. A Kehr 'T' tube was inserted for biliary drainage. A new ERCP performed 35 days after operation showed a peripapillary fistulous orifice. Two stents of Tannenbaum type, 8.5 Fr and 10 Fr, were introduced into the bile duct using infundibulotomy as the only feasible treatment because the stone still could not be removed. The patient returned after 2 weeks with colicky pain. Abdominal X-rays showed that one stent had migrated to the pelvis. Laxatives were prescribed to help stent progression, but peritonitis developed after 48 hours. Laparotomy revealed a loop of a small intestine that was kinked and adherent to the caesarean scar. The stent had perforated the loop in situ. The stent was retrieved, and the intestinal loop was released and sutured. Two weeks later another ERCP allowed papillotomy, stone removal, retrieval of the other endoprosthesis and withdrawal of the 'T' tube. The patient recovered satisfactorily.

Discussion

In 1979 Soehendra and co-workers [1] described the use of transpapillary access to place plastic biliary stents. The complication rate ranges between 8% and 10%, with a mortality rate below 1%. Migration of these stents proximal to the stenosis occurs in 4.9% of patients [2, 3]. Most of these stents can be retrieved using endoscopy [2, 4, 5] and fluoroscopy. If the stent migrates to the digestive tube, then 43% are evacuated spontaneously [6]. Plastic stent migration is more frequent in patients with benign pathology without severe stenosis of the bile duct or papilla.

Most migrated stents become embedded in the duodenum, usually in diverticula [2, 7]. Treatment for stent retrieval is carried out endoscopically [8], using baskets, forceps or the lasso technique [5], except for

stents that have perforated the wall or protrude through a duodenal diverticulum. Although most migrated stents are made of plastic, migration of metallic stents has also been described [9, 10]. Cotton stents (Wilson Cook) have fewer fixation edges compared with the Tannenbaum, Soehendra or Arbolit stents and thus presumably favour migration. Both cases reported here involved the Tannenbaum stents.

Lopez Roses and colleagues [3] have described the case of a plastic stent perforating the duodenal wall that was retrieved by endoscopy. A clip was placed in the perforation at the same time. Other cases have been reported of bowel perforation through loops incarcerated in a hernial sac [11], in a colon diverticulum [2, 12] and also in healthy sigmoid colon [13]. The migrated stent may induce upper [9] or lower [14] gastrointestinal bleeding.

Most stent perforations occur in places where the intestine is congenitally fixed (duodenum [15], right colon) or in duodenal diverticula [1, 5, 16–20]. Fixation of bowel to a hernial sac, previous postoperative eventration or adherence is the common denominator for wall perforation because these conditions impede progression [5, 21]. Ang and Wanshik [22] described a duodenocolic fistula caused by a stent.

Peritoneal signs are only evident if all the layers of the intestine have been perforated. Pain, gastrointestinal bleeding and X-ray images of a stent outside the intestinal wall indicate impaction. Pneumoperitoneum [23] indicates perforation of the small bowel. Signs of peritonitis are always present.

Whenever a perforation is suspected or confirmed, operative treatment is required. Several studies mention endoscopic extraction and clip placement in the orifice of the duodenal perforation [3] or percutaneous extraction [16]. We do not agree with this method. In our patients operation was chosen because of suspicion of caecal perforation in one case and peritoneal signs in the other.

Serious complications can result from stent migration. Consequently, it is important to control the process until elimination by natural means or by the use of non-invasive methods. Endoprostheses may migrate either immediately after placement or much later (60 days). For this reason replacement every 3 months is recommended. To the best of our knowledge there are no comparative studies between surgical methods and endoscopic procedures. In conclusion, although endoscopy is the treat-

ment of choice to retrieve migrated stents, operation should be performed whenever intestinal perforation is suspected.

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